

SGS Report No. 177:014010-012

**SAFETY COMPLIANCE TESTING FOR FMVSS No. 218
Motorcycle Helmets**

**Model
ARAI RX-7 CORSAIR**

**SGS U.S. TESTING COMPANY INC.
291 FAIRFIELD AVENUE
FAIRFIELD, NJ 07004**



FINAL REPORT

**218-UST-08-012
September 16, 2008**

PREPARED FOR

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
(NVS-220)
1200 New Jersey Avenue, S.E.
WASHINGTON, D.C. 20590**

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Report No.: 177:014010 - 012

Prepared by: SGS U.S. Testing Company Inc.

Approved by: Frank Savino

FRANK SAVINO

Date : September 16, 2008

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: Alexandra Peterlin HS#640065

Acceptance Date: 10-6-08

TECHNICAL REPORT Title Page

1. Report No. 218-UST-08-012	2. Govt. Accession No.		3. Recipient's Catalog No.
4. Title and Sub-Title Motorcycle Helmet Compliance Testing, FMVSS No. 218 Model: ARAI RX-7 CORSAIR, Final Report.		5. Report Date: September 16, 2008	
		6. Performing Organization Code UST	
7. Author Frank Savino, Project Manager		8. Performing Organization Report No. 177:014010 - 012	
9. Performing Organization Name and Address: SGS U.S. Testing Company Inc. 291 Fairfield Avenue Fairfield, NJ 07004		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-04-C-01002, Modification 011	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance, (NVS-220) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590		13. Type of Report and Period Covered: FINAL TEST REPORT	
		14. Sponsoring Agency Code NVS-220	
16. Abstract Compliance tests were conducted on the subject motorcycle helmet in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-218-06. Test failures identified were as follows: None			
17. Key Words FMVSS No. 218 Compliance Testing Safety Engineering		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, (NPO-411) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590 tis@dot.gov	
19. Security Classif. (Of This Report) Unclassified	20. Security Classif. (Of This Page) Unclassified	21. No of Pages: 36	22. Price

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SECTION 1

PURPOSE OF COMPLIANCE TEST

PURPOSE AND TEST PROCEDURES

Purpose:

This testing was conducted as part of the Department of Transportation, National Highway Traffic Safety Administration's Federal Motor Vehicle Safety Standard (FMVSS) No.218, Motorcycle Helmets, Compliance Program. The purpose of the test was to determine if the production helmets supplied by the Office of Vehicle Safety Compliance satisfy the requirements of TP-218-06, as governed by the contract.

Test Procedure:

The SGS U.S. Testing Company, Instrumentation, Calibration and Test Procedure for Testing of Motorcycle Helmets Under FMVSS 218 (November 2006) as submitted to the "Office of Vehicle Safety Compliance, National Highway Traffic Safety Administration (NHTSA) and" TP-218-06, NHTSA "**Laboratory Test Procedure for FMVSS No. 218 Motorcycle Helmets**".

SECTION 2

COMPLIANCE TEST DATA SUMMARY

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

LAB REPORT NO.: 177:014010 - 012

DATE: September 9, 2008

HELMET DATA

HELMET BRAND NAME: ARAI HELMET

HELMET MODEL DESIGNATION: RX-7 CORSAIR

HELMET MANUFACTURER: ARAI HELMET, LIMITED

HELMET SIZE: XL 61-62 cm

CORRESPONDING HEADFORM SIZE: DOT- D

HELMET COVERAGE: Complete Facial

HELMET POSITIONING INDEX: 50 mm

SHELL MATERIAL: Fiberglass Reinforced Polystyrene Resin

LINER MATERIAL: Expanded Polystyrene

BUCKLE DESCRIPTION: Double "D" Ring

HELMET	A Ambient	B Low Temperature	C High Temperature	D Water Immersed	E Spare
SHELL COLOR/PATTERN	GREY	GREY	GREY	GREY	
WEIGHT (grams)	1629	1624	1638	1591	
MONTH & YEAR OF MANUFACTURE	3/08	3/08	3/08	3/08	

COMMENTS: NHTSA provided the HPI based on information obtained from the manufacturer.

RECORDED BY: Edwin Rivera

APPROVED BY: FRANK SAVINO

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

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SELECTION OF APPROPRIATE HEADFORM

Paragraph S6.1 - If the helmet size designation falls into more than one of three size ranges, it shall be tested on each appropriate headform.

<u>HELMET SIZE DESIGNATION</u>	<u>HEADFORM SIZE</u>
Less than or equal to 6-3/4 (European Size 54)	Small
Greater than 6-3/4, but less than or equal to 7-1/2 (European Size 60)	Medium
Greater than 7-1/2 (European Size 60)	Large

COMMENTS: The manufacturer marked the helmet with its corresponding discrete size.
Headform Size: DOT-D Large, Helmet: ARAI, Model: RX-7 CORSAIR, Size: XL 61-62 cm.

CONDITIONING FOR TESTING - Paragraph S6.4 - The protective headgear shall be conditioned for not less than 12 hours, in the specified environmental condition shown below, prior to test.

Ambient Condition	21°C ± 6°C 40% to 60% Relative Humidity
Low Temperature	-10°C + 8°C, -0°C
High Temperature	50°C + 0°C, -4°C
Water Immersed	25°C ± 6°C

The maximum time during which the protective headgear may be out of the conditioning environment shall not exceed 4 minutes. It must then be returned to the conditioning environment for a minimum of 3 minutes for each minute or portion of a minute in excess of 4 minutes out of the conditioning environment or 12 hours, whichever is less, prior to resumption of testing.

COMPLIANCE TEST DATA SUMMARY
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

LAB REPORT NO.: 177:014010 – 012

DATE OF TEST: September 9, 10, 2008

SUMMARY OF TEST RESULTS

INDICATE P-PASS

F-FAIL

HELMET: TEST	A	B	C	D	NOTES
	Ambient	Low Temperature	High Temperature	Water Immersed	
IMPACT PENETRATION RETENTION PERIPHERAL VISION LABELING	P	P	P	P	
	P	P	P	P	
	P	P	P	P	
	P	P	P	P	
	P	P	P	P	

COMMENTS:

RECORDED BY: Edwin Rivera

APPROVED BY: Frank Savino

SECTION 3

TEST DATA

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

LAB REPORT NO.: 177:014010 – 012

DATE OF TEST: September 10, 2008

Ambient Temperature (°C) 21°C ± 6°C 40% to 60% Relative Humidity	
Headform Size Large	Drop Assembly Weight (kg) 6.1
Headform Position Index 50 mm	

SYSTEMS	TRIAL	DROP	VEL.	PEAK	MILLISECONDS @	
CHECK	DROP	HEIGHT	(m/sec)	"G"	150 G	200 G
	1	138 cm	5.20	395	2.24	1.60
PRE-TEST	2	138 cm	5.22	391	2.00	1.68
	3	138 cm	5.23	386	2.16	1.68
PRE-TEST AVERAGE XXXXXXXXXXXXXXXXXXXX				391	XXXXXXXXXXXXXXXXXXXX	
	1	138 cm	5.23	376	2.32	1.84
POST-TEST	2	138 cm	5.22	386	2.24	1.84
	3	138 cm	5.22	379	2.32	1.76
POST-TEST AVERAGE XXXXXXXXXXXXXXXXXXXX				380	XXXXXXXXXXXXXXXXXXXX	
DIFFERENCE BETWEEN PRE-TEST AND POST-TEST AVERAGES				11 G's	PEAK G	DIFFERENCE NOT TO EXCEED 40 G's

COMMENTS:

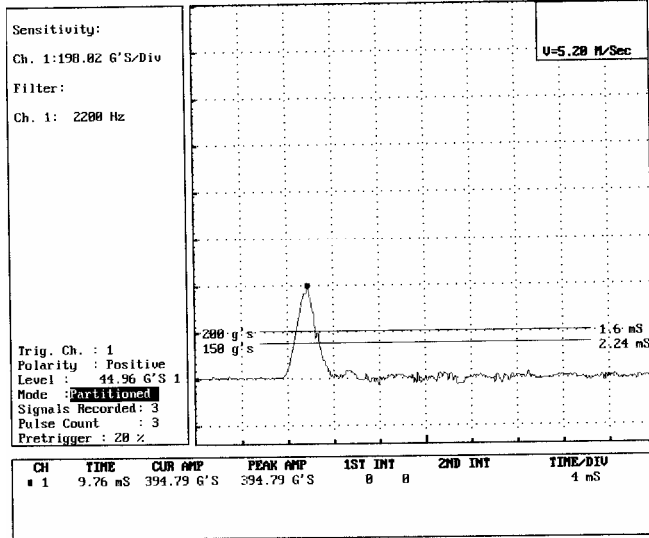
RECORDED BY: Edwin Rivera

APPROVED BY: Frank Savino

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 07:58 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 1-PR 177:014010-012
 LOCATION: MEP TEST PAD REPORT NO. ARAI RX-7 CORSAIR
 SAMPLE:



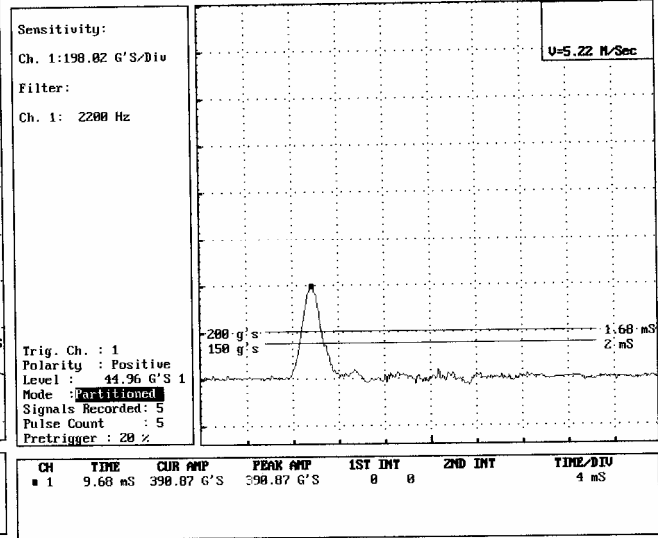
Remarks:

Size:XL 61-62cm.

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 08:02 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 2-PR 177:014010-012
 LOCATION: MEP TEST PAD REPORT NO. ARAI RX-7 CORSAIR
 SAMPLE:



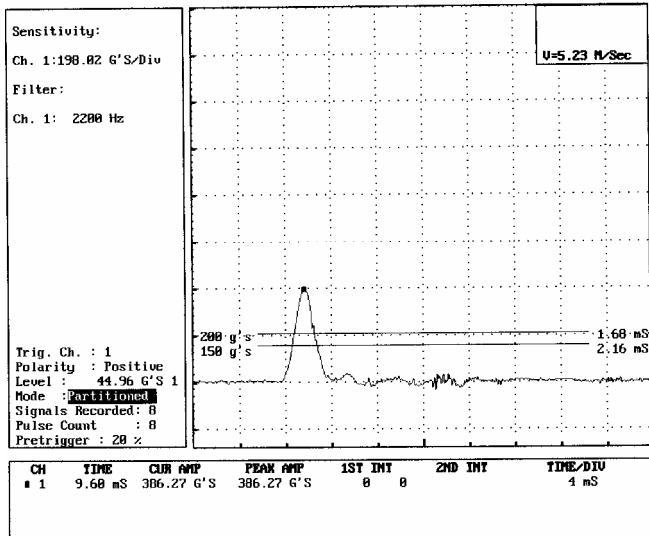
Remarks:

Size:XL 61-62cm.

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 08:04 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 3-PR 177:014010-012
 LOCATION: MEP TEST PAD REPORT NO. ARAI RX-7 CORSAIR
 SAMPLE:



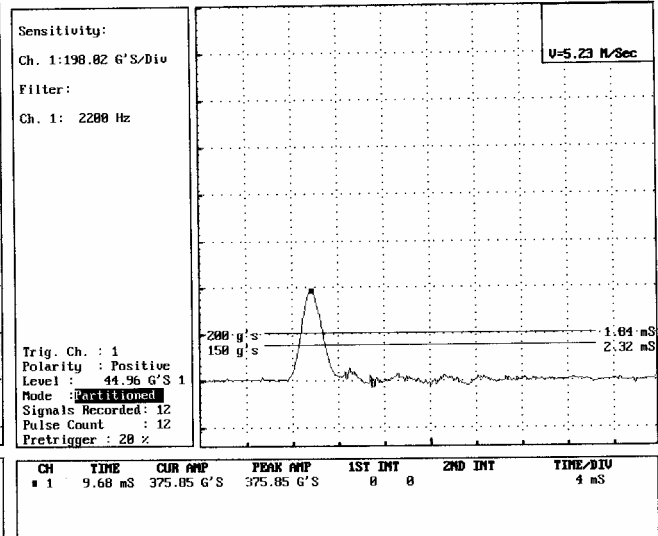
Remarks:

Size:XL 61-62cm.

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 11:05 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 1-POST 177:014010-012
 LOCATION: MEP TEST PAD REPORT NO. ARAI RX-7 CORSAIR
 SAMPLE:



Remarks:

Size:XL 61-62cm.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME
IMP#:/TEMP.
LOCATION:

Wed Sep 10 08 11:15
2-POST
MEP TEST PAD

CLIENT:
REPORT NO.
SAMPLE:

DOT/NHTSA
177:014010-012
ARAI RX-7 CORSAIR

Waveform Test Report

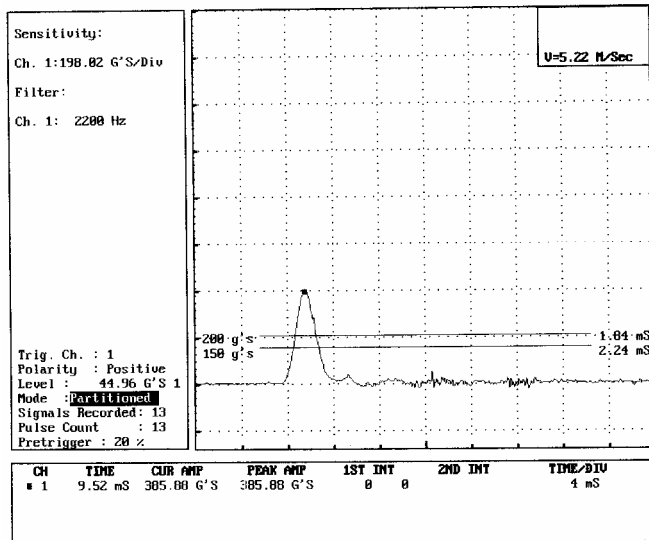
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DATE / TIME
IMP#:/TEMP.
LOCATION:

Wed Sep 10 08 11:18
3-POST
MEP TEST PAD

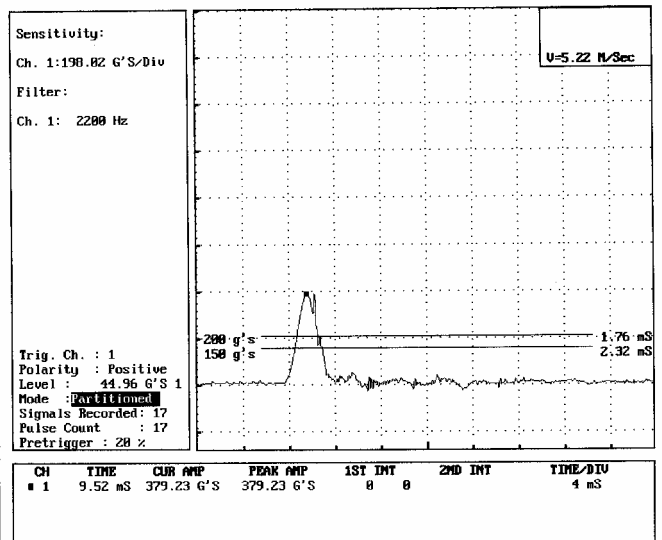
CLIENT:
REPORT NO.
SAMPLE:

DOT/NHTSA
177:014010-012
ARAI RX-7 CORSAIR



Remarks:

Size: XL 61-62cm.



Remarks:

Size: XL 61-62cm.

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

LAB REPORT NO.: 177:014010 - 012

DATE OF TEST: September 10, 2008

IMPACT TEST

Helmet Condition		IMPACT LOCATION							
	ANVIL	FRONT HEMI		LEFT HEMI		RIGHT FLAT		REAR FLAT	
Ambient	Impact No.	1	2	1	2	1	2	1	2
	Test Record No.	1	2	9	10	17	18	25	26
	Peak "G"	129	137	113	106	166	180	195	173
	ms @ 150 "G"	--	--	--	--	0.7	1.4	1.0	1.8
	ms @ 200 "G"	--	--	--	--	--	--	--	--
	Velocity m/sec	5.24	5.22	5.23	5.22	5.98	5.99	5.96	5.98
Low	Test Record No.	3	4	11	12	19	20	27	28
	Peak "G"	151	157	114	104	201	201	167	175
	ms @ 150 "G"	0.2	0.2	--	--	1.0	1.4	0.5	2.1
	ms @ 200 "G"	--	--	--	--	--	--	--	--
	Velocity m/sec	5.19	5.23	5.20	5.18	5.95	5.99	5.99	5.95
High	Test Record No.	5	6	13	14	21	22	29	30
	Peak "G"	112	145	107	98	180	169	145	165
	ms @ 150 "G"	--	--	--	--	0.7	1.2	--	0.7
	ms @ 200 "G"	--	--	--	--	--	--	--	--
	Velocity m/sec	5.22	5.20	5.22	5.20	5.98	6.00	5.95	5.99
Wet	Test Record No.	7	8	15	16	23	24	31	32
	Peak "G"	103	126	118	101	161	180	145	163
	ms @ 150 "G"	--	--	--	--	0.8	1.2	--	0.6
	ms @ 200 "G"	--	--	--	--	--	--	--	--
	Velocity m/sec	5.24	5.22	5.22	5.23	6.00	5.99	5.99	5.99

COMMENTS:

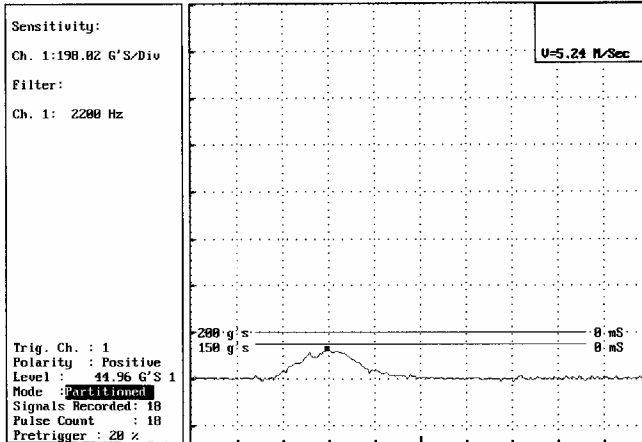
RECORDED BY: Edwin Rivera

APPROVED BY: Frank Savino

Waveform Test Report

GSI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 08:38 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 01-AMBIENT REPORT NO. 177:014010-012
 LOCATION: FRONT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



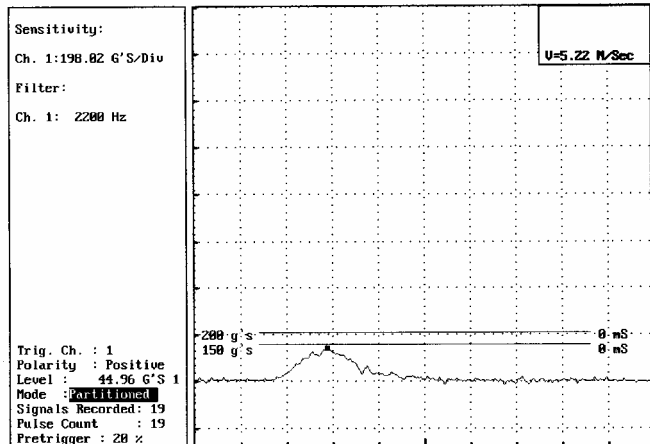
Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GSI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 08:43 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 02-AMBIENT REPORT NO. 177:014010-012
 LOCATION: FRONT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



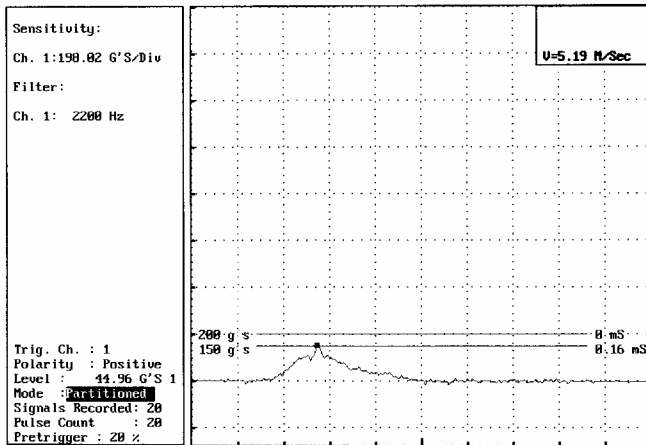
Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GSI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 08:46 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 03-LOW TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: FRONT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



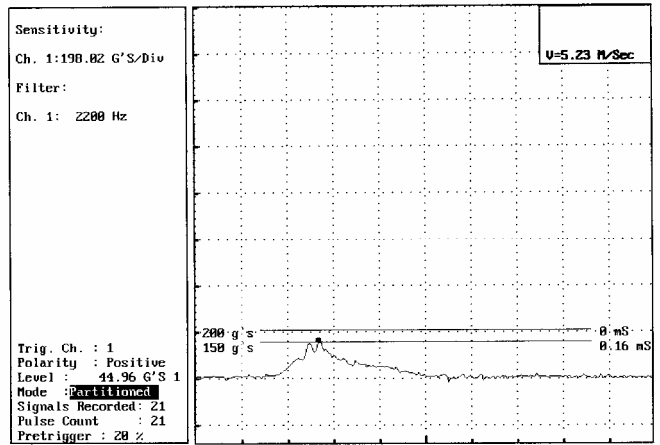
Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GSI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 08:47 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 04-LOW TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: FRONT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR

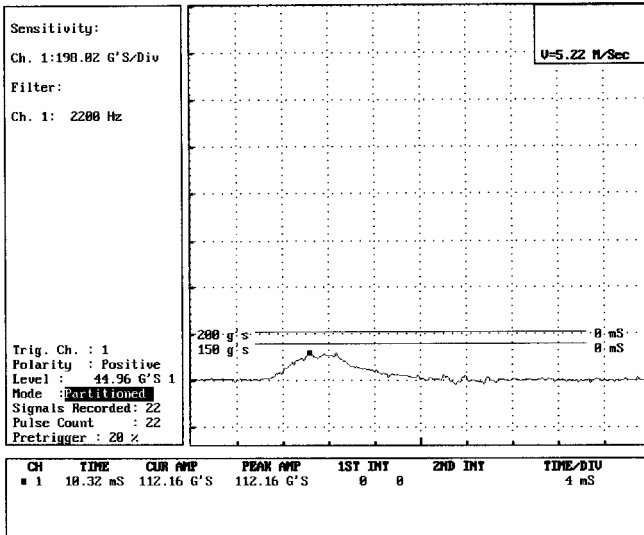


Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GHI SYSTEMS, INC. CAT SYSTEM

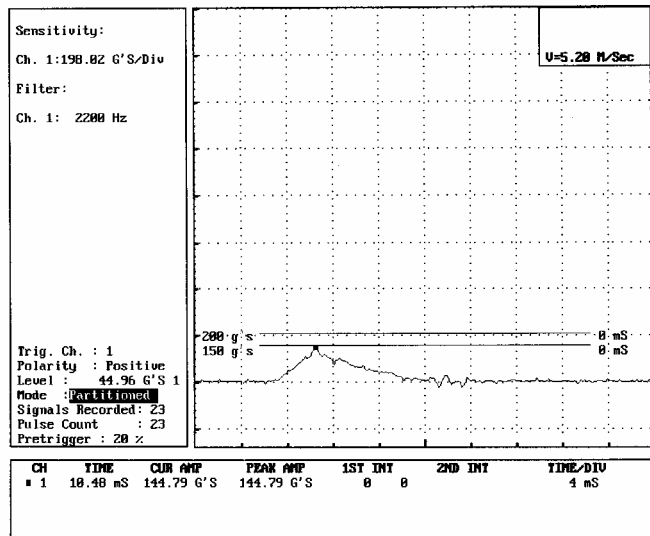
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IMP#:/TEMP.: 05-HIGH TEMPERATURE
LOCATION: FRONT HEMI IMPACT
CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



Remarks:
Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GHI SYSTEMS, INC. CAT SYSTEM

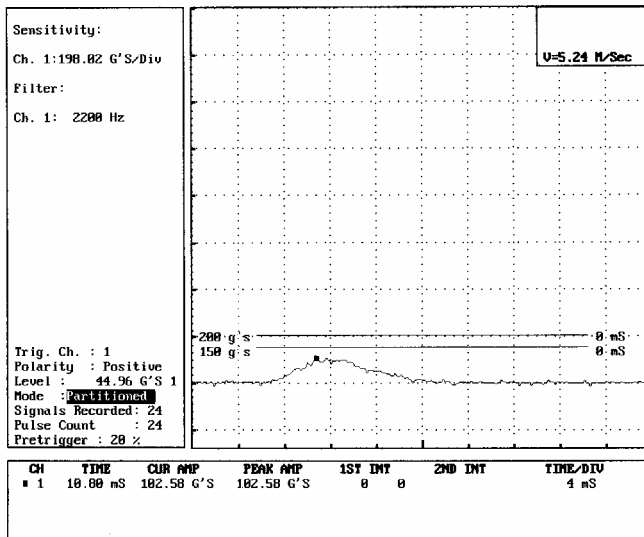
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IMP#:/TEMP.: 06-HIGH TEMPERATURE
LOCATION: FRONT HEMI IMPACT
CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



Remarks:
Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GHI SYSTEMS, INC. CAT SYSTEM

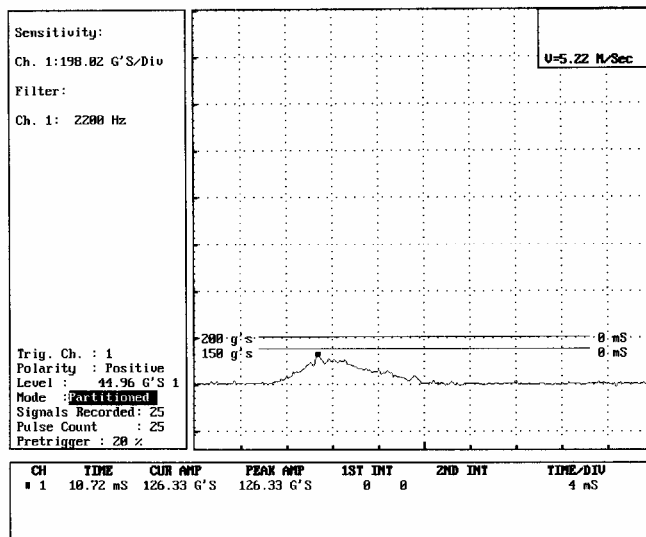
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IMP#:/TEMP.: 07-IMMERSED
LOCATION: FRONT HEMI IMPACT
CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



Remarks:
Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GHI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 08:53
IMP#:/TEMP.: 08-IMMERSED
LOCATION: FRONT HEMI IMPACT
CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR

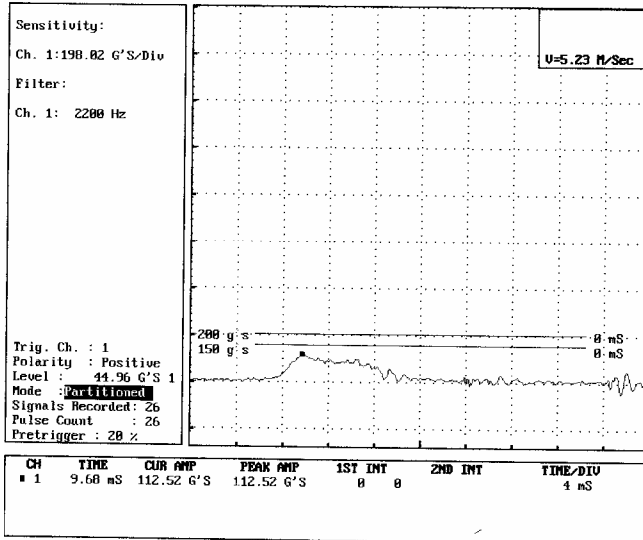


Remarks:
Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:09 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 09-AMBIENT REPORT NO. 177:014010-012
 LOCATION: LEFT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



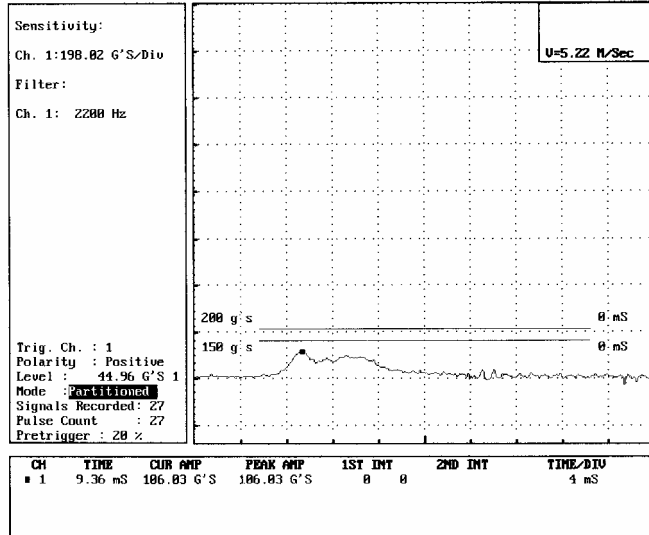
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Size:XL 61-62cm. HPI:50mm. Headform:DOT-D Large.

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:11 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 10-AMBIENT REPORT NO. 177:014010-012
 LOCATION: LEFT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



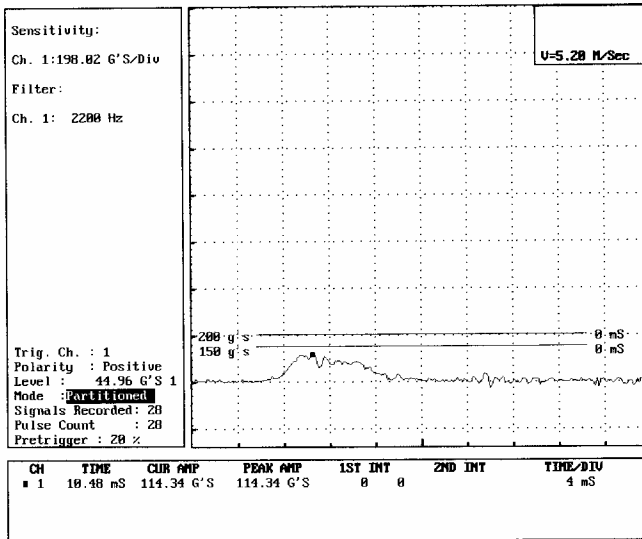
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Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:14 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 11-LOW TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: LEFT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



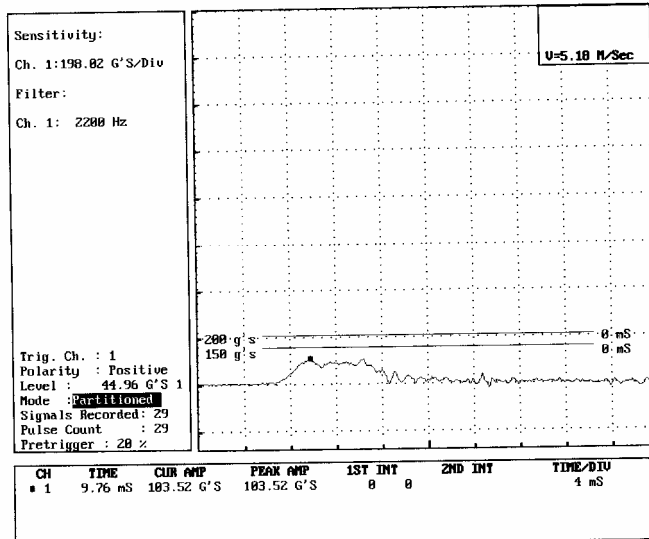
Remarks:

Size:XL 61-62cm. HPI:50mm. Headform:DOT-D Large.

Waveform Test Report

GEI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:15 CLIENT: DOT/NHTSA
 IMP#:/TEMP. 12-LOW TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: LEFT HEMI IMPACT SAMPLE: ARAI RX-7 CORSAIR



Remarks:

Size:XL 61-62cm. HPI:50mm. Headform:DOT-D Large.

Waveform Test Report

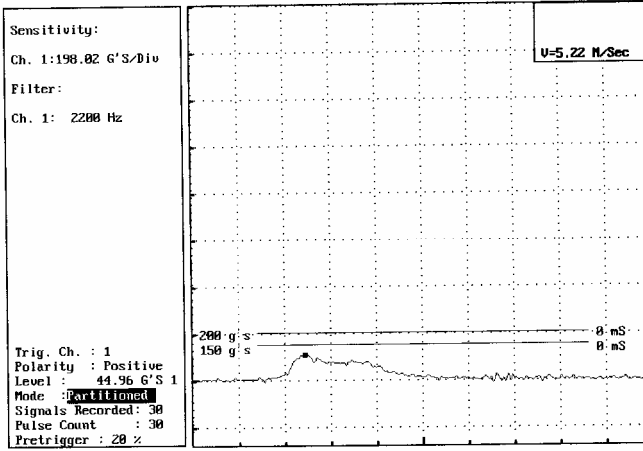
GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME
IMP#:/TEMP.
LOCATION:

Wed Sep 10 08 09:18
13-HIGH TEMPERATURE
LEFT HEMI IMPACT

CLIENT:
REPORT NO.
SAMPLE:

DOT/NHTSA
177:014010-012
ARAI RX-7 CORSAIR



Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

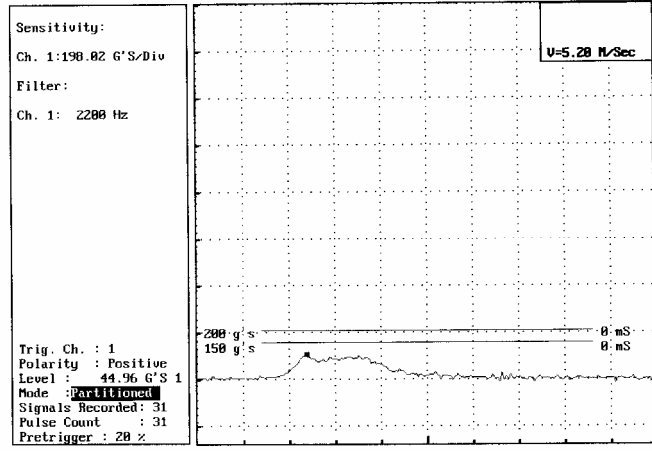
GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME
IMP#:/TEMP.
LOCATION:

Wed Sep 10 08 09:18
14-HIGH TEMPERATURE
LEFT HEMI IMPACT

CLIENT:
REPORT NO.
SAMPLE:

DOT/NHTSA
177:014010-012
ARAI RX-7 CORSAIR



Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

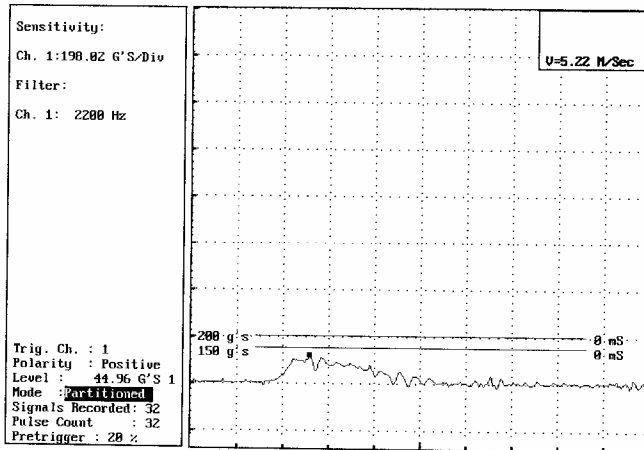
GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME
IMP#:/TEMP.
LOCATION:

Wed Sep 10 08 09:20
15-IMMERSED
LEFT HEMI IMPACT

CLIENT:
REPORT NO.
SAMPLE:

DOT/NHTSA
177:014010-012
ARAI RX-7 CORSAIR



Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

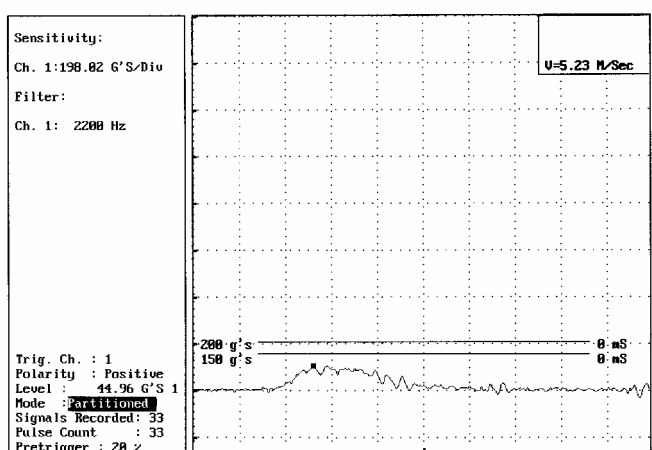
GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME
IMP#:/TEMP.
LOCATION:

Wed Sep 10 08 09:21
16-IMMERSED
LEFT HEMI IMPACT

CLIENT:
REPORT NO.
SAMPLE:

DOT/NHTSA
177:014010-012
ARAI RX-7 CORSAIR



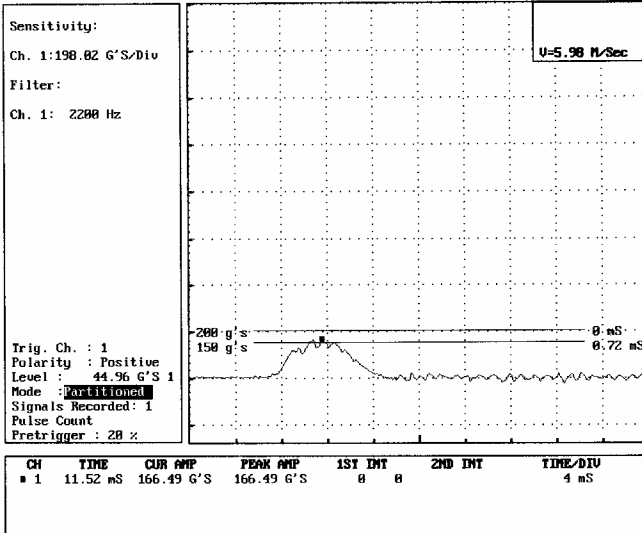
Remarks:

Size:XL 61-62cm. HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GHI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:31 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 17-AMBIENT REPORT NO. 177:014010-012
 LOCATION: RIGHT FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



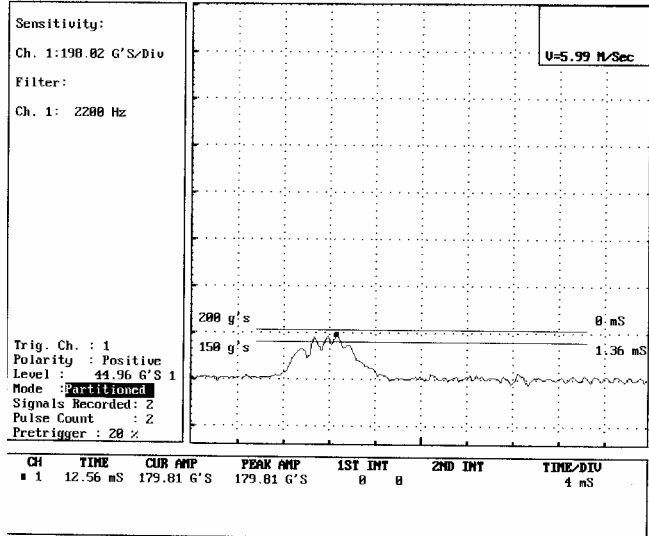
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GHI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:35 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 18-AMBIENT REPORT NO. 177:014010-012
 LOCATION: RIGHT FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



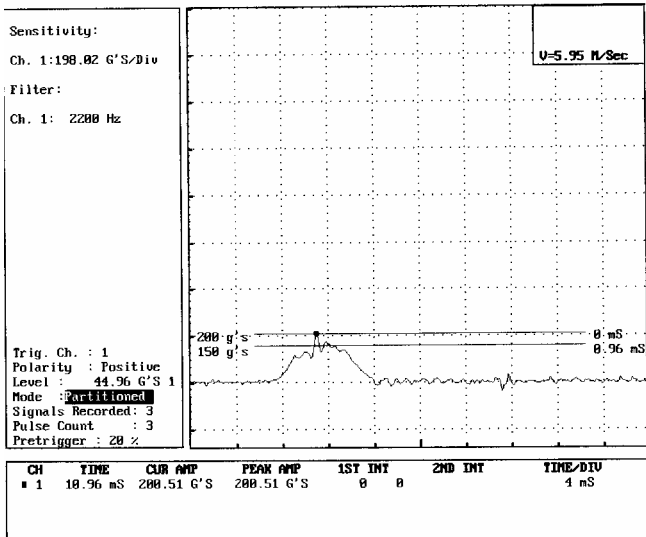
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GHI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:38 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 19-LOW TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: RIGHT FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



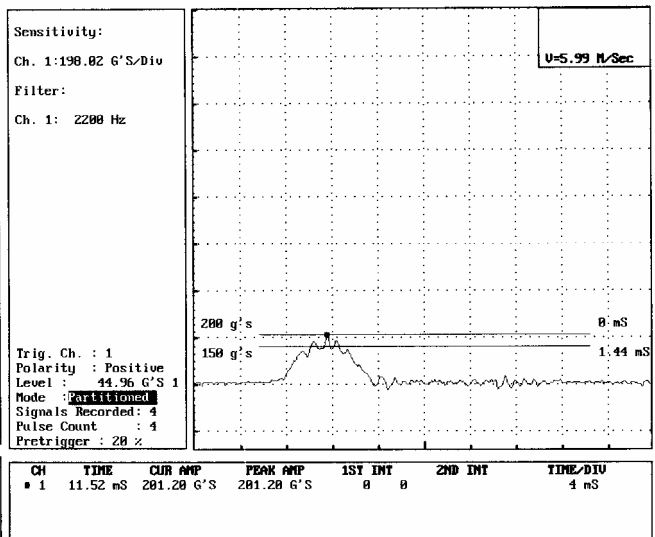
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GHI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 09:39 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 20-LOW TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: RIGHT FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



Remarks:

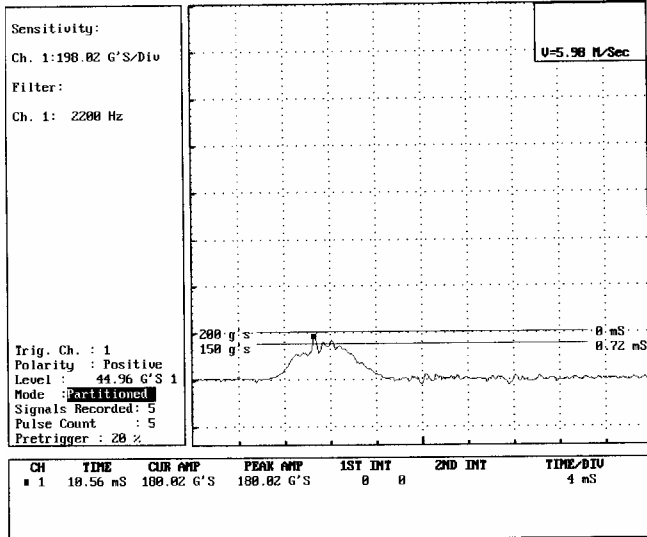
Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:00
 IMP#://TEMP.: 21-HIGH TEMPERATURE
 LOCATION: RIGHT FLAT IMPACT

CLIENT: DOT/NHTSA
 REPORT NO.: 177:014010-012
 SAMPLE: ARAI RX-7 CORSAIR



Remarks:

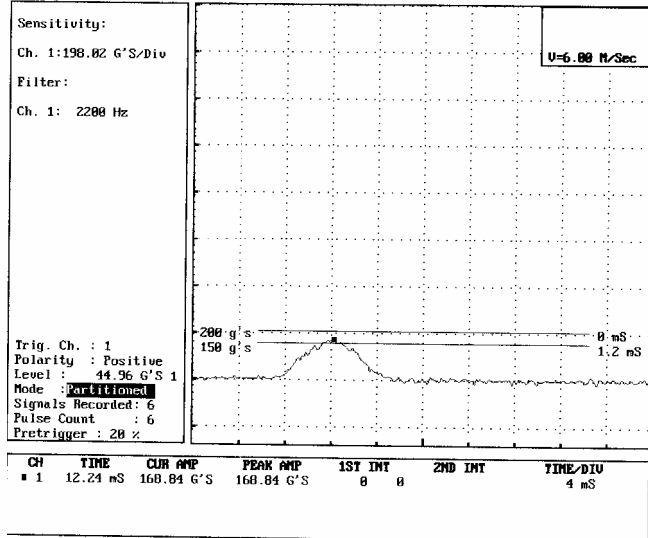
Size:x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:01
 IMP#://TEMP.: 22-HIGH TEMPERATURE
 LOCATION: RIGHT FLAT IMPACT

CLIENT: DOT/NHTSA
 REPORT NO.: 177:014010-012
 SAMPLE: ARAI RX-7 CORSAIR



Remarks:

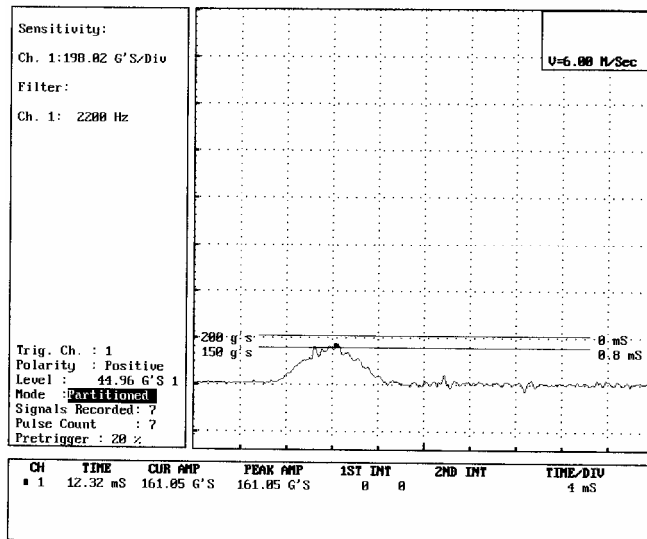
Size:x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:02
 IMP#://TEMP.: 23-IMMERSED
 LOCATION: RIGHT FLAT IMPACT

CLIENT: DOT/NHTSA
 REPORT NO.: 177:014010-012
 SAMPLE: ARAI RX-7 CORSAIR



Remarks:

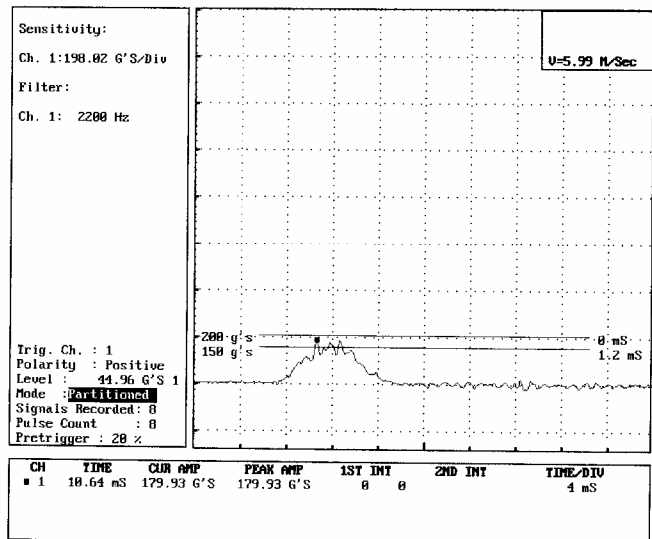
Size:x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:03
 IMP#://TEMP.: 24-IMMERSED
 LOCATION: RIGHT FLAT IMPACT

CLIENT: DOT/NHTSA
 REPORT NO.: 177:014010-012
 SAMPLE: ARAI RX-7 CORSAIR



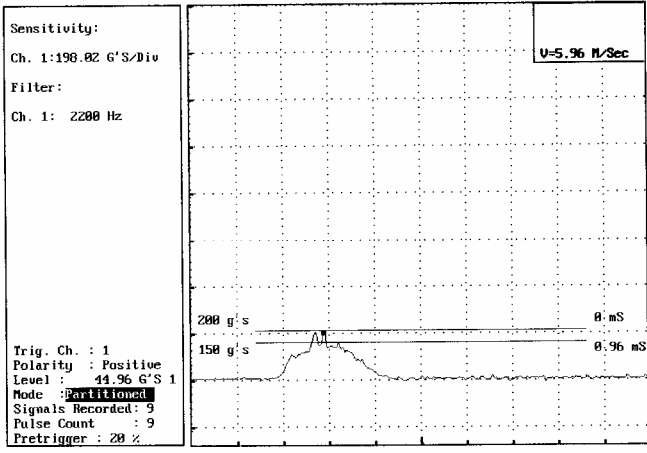
Remarks:

Size:x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GBI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:09
IMP#: /TEMP.: 25-AMBIENT
LOCATION: REAR FLAT IMPACT

CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	11.52 mS	194.59 G'S	194.59 G'S	0	0	4 mS

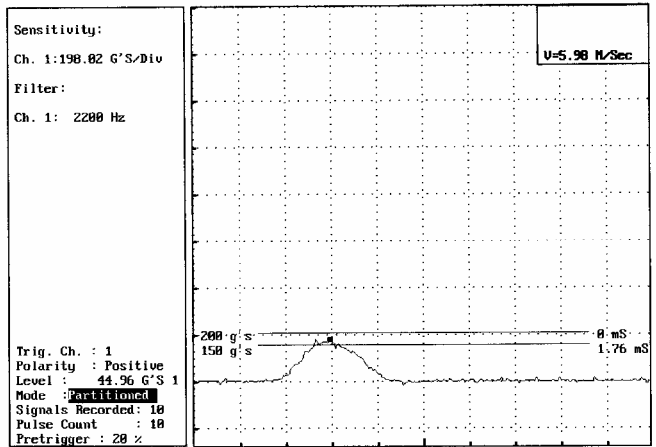
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GBI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:11
IMP#: /TEMP.: 26-AMBIENT
LOCATION: REAR FLAT IMPACT

CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	11.84 mS	172.89 G'S	172.89 G'S	0	0	4 mS

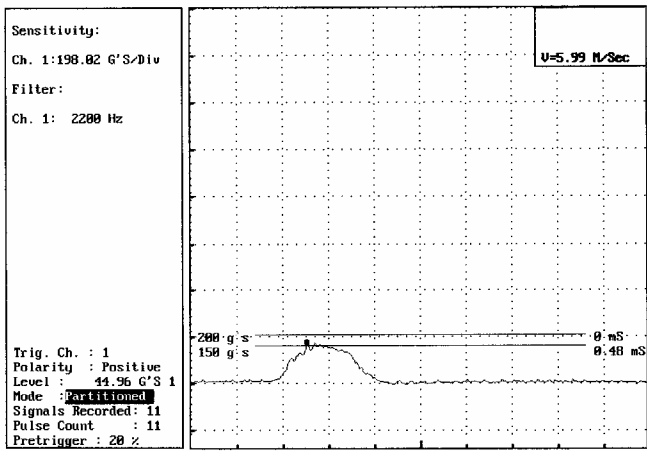
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GBI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:13
IMP#: /TEMP.: 27-LOW TEMPERATURE
LOCATION: REAR FLAT IMPACT

CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	10.00 mS	167.21 G'S	167.21 G'S	0	0	4 mS

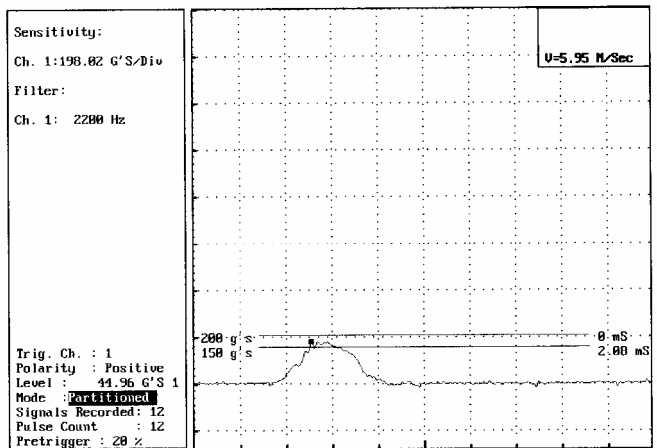
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report
GBI SYSTEMS, INC. CAT SYSTEM

DATE / TIME: Wed Sep 10 08 10:14
IMP#: /TEMP.: 28-LOW TEMPERATURE
LOCATION: REAR FLAT IMPACT

CLIENT: DOT/NHTSA
REPORT NO.: 177:014010-012
SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	10.16 mS	174.52 G'S	174.52 G'S	0	0	4 mS

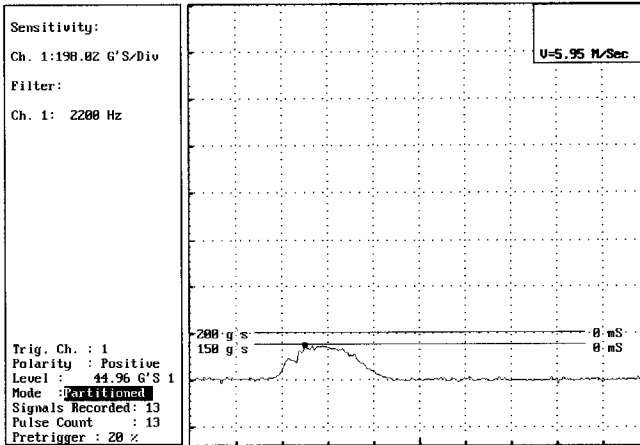
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 10:17 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 29-HIGH TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: REAR FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	10.00 mS	144.55 G'S	144.55 G'S	0	0	4 mS

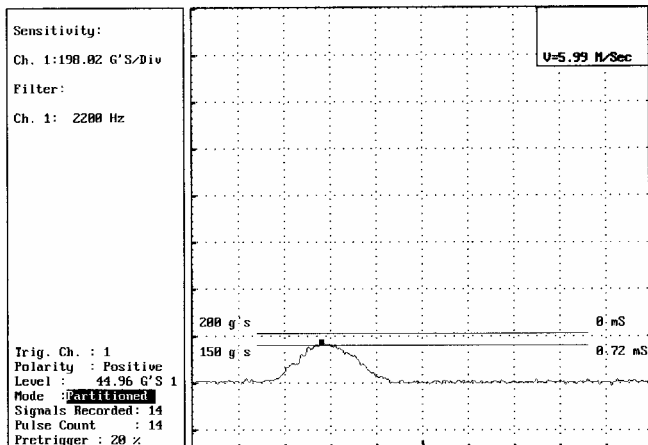
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 10:18 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 30-HIGH TEMPERATURE REPORT NO. 177:014010-012
 LOCATION: REAR FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	11.28 mS	165.34 G'S	165.34 G'S	0	0	4 mS

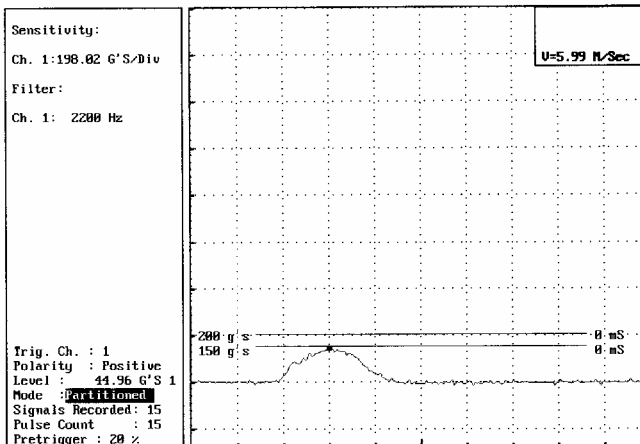
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 10:19 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 31-IMMERSED REPORT NO. 177:014010-012
 LOCATION: REAR FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	12.00 mS	145.22 G'S	145.22 G'S	0	0	4 mS

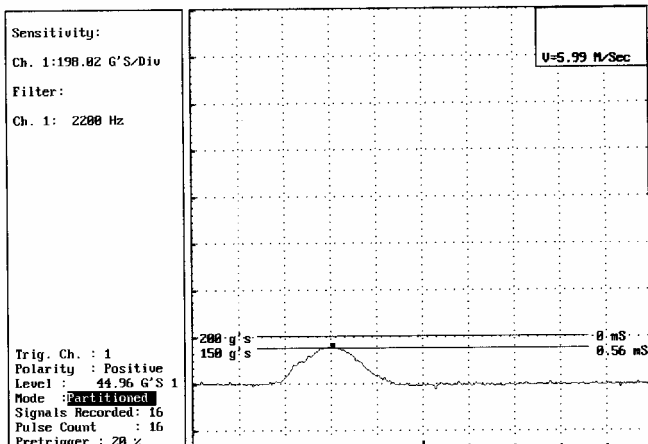
Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

Waveform Test Report

GRI SYSTEMS, INC. CAT SYSTEM

DATE / TIME Wed Sep 10 08 10:20 CLIENT: DOT/NHTSA
 IMP#: /TEMP. 32-IMMERSED REPORT NO. 177:014010-012
 LOCATION: REAR FLAT IMPACT SAMPLE: ARAI RX-7 CORSAIR



CH	TIME	CUR AMP	PEAK AMP	1ST INT	2ND INT	TIME/DIV
1	12.16 mS	163.22 G'S	163.22 G'S	0	0	4 mS

Remarks:

Size: x1 61-62CM HPI:50mm, Headform:DOT-D Large.

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-0012

LAB REPORT NO.: 177:014010 - 012

DATE OF TEST: September 10, 2008

PENETRATION

Paragraph S5.2 and S7.2

WEIGHT OF STRIKER: 3 Kg

POINT OF STRIKER: Radius = 0.5 mm, included angle of 60° + 1.0°, - 0.0, hardness minimum of 60 Rockwell "C" Scale and a cone height of not less than 3.81 cm

HEIGHT OF FALL: 300 cm, + 0.0 cm, -3.05 cm measured from the tip of the striker point to the outer surface of the mounted protective headgear.

FAILURE CRITERION: When tested, the striker shall not contact the surface of the test headform.

<u>TEST</u>	<u>HELMET</u>	<u>PASS</u>	<u>FAIL</u>	<u>CONDITIONS</u>
1	A	P		Ambient
2	A	P		Ambient
3	B	P		Low Temperature
4	B	P		Low Temperature
5	C	P		High Temperature
6	C	P		High Temperature
7	D	P		Water Immersed
8	D	P		Water Immersed

COMMENTS: Striker height set using 297.2 cm rod.

RECORDED BY: Edwin Rivera

APPROVED BY: Frank Savino

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

LAB REPORT NO.: 177:014010 - 012

DATE OF TEST: September 10, 2008

Paragraph S5.3 and S7.3

AMBIENT TEMPERATURE: 21°C ± 6°C

AMBIENT HUMIDITY: 50 %

REQUIREMENTS:

<u>READING</u>	<u>APPLIED LOAD</u>
INITIAL	22.7 kg, + 4.5 kg, - 0 kg
FINAL	136 kg, + 0 kg, - 4.5 kg

ELONGATION NOT TO EXCEED 25.4 mm AFTER LOAD INCREASE

<u>HELMET</u>	<u>CONDITIONS</u>	<u>Elongation mm</u>
A	Ambient	14.534
B	Low Temperature	15.066
C	High Temperature	13.895
D	Water Immersed	16.893

COMMENTS:

PERIPHERAL VISION - Paragraph S5.4 - Helmet shall provide a minimum peripheral vision of 105° to each side of the midsagittal plane. The brow opening shall be at least 2.54 cm above all points in the basic plane that are within the angles of peripheral vision.

	<u>REQUIREMENTS</u>	<u>TEST RESULTS</u>
DEGREE EACH SIDE M.S. PLANE	>105°	Pass
BROW OPENING	>2.54 cm	Pass

RECORDED BY: Edwin Rivera

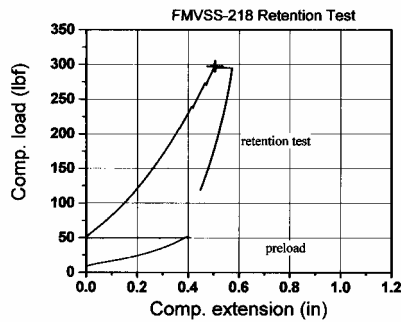
APPROVED BY: Frank Savino

SGS

Company: DOT/NHTSA Name: ARAI RX-7 SZ: XL61-62cm
 Lab name: STME Number of specimens: 1
 Operator ID: E.R. Temperature: 23 C
 Test date: 9/10/2008 Humidity: 50 %
 Condition: A-AMBIENT TEMP. 21°C (70°F) Crosshead Speed: 1.2 in/min
 JOB# 177:014010-012

Results

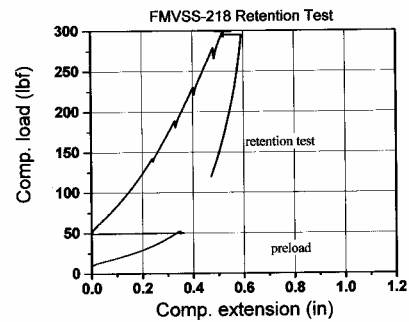
	Max Load (kgf)	Max Load (lbf)	Extension @ Max Load (mm)	Extension @ Max Load (in)	Pass/Fail	Max. Load (kgf)	Max. Load (lbf)
1	133.80	294.99	14.534	0.57	PASS	135.0	297.5

Curves**SGS**

Company: DOT/NHTSA Name: ARAI RX-7 SZ: XL61-62cm
 Lab name: STME Number of specimens: 1
 Operator ID: E.R. Temperature: 23 C
 Test date: 9/10/2008 Humidity: 50 %
 Condition: B-LOW TEMP. -10°C (14°F) Crosshead Speed: 1.2 in/min
 JOB# 177:014010-012

Results

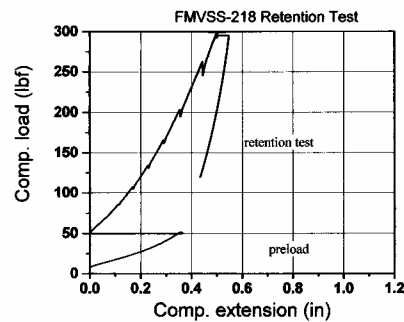
	Max Load (kgf)	Max Load (lbf)	Extension @ Max Load (mm)	Extension @ Max Load (in)	Pass/Fail	Max. Load (kgf)	Max. Load (lbf)
1	133.82	295.02	15.066	0.59	PASS	135.7	299.1

Curves**SGS**

Company: DOT/NHTSA Name: ARAI RX-7 SZ: XL61-62cm
 Lab name: STME Number of specimens: 1
 Operator ID: E.R. Temperature: 23 C
 Test date: 9/10/2008 Humidity: 50 %
 Condition: C-HIGH TEMP. 50°C (121°F) Crosshead Speed: 1.2 in/min
 JOB# 177:014010-012

Results

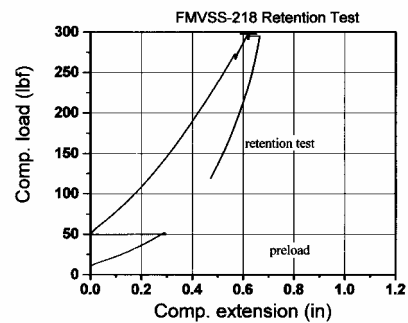
	Max Load (kgf)	Max Load (lbf)	Extension @ Max Load (mm)	Extension @ Max Load (in)	Pass/Fail	Max. Load (kgf)	Max. Load (lbf)
1	133.81	295.00	13.895	0.55	PASS	135.6	298.9

Curves**SGS**

Company: DOT/NHTSA Name: ARAI RX-7 SZ: XL61-62cm
 Lab name: STME Number of specimens: 1
 Operator ID: E.R. Temperature: 23 C
 Test date: 9/10/2008 Humidity: 50 %
 Condition: D-WATER TEMP. 25°C (77°F) Crosshead Speed: 1.2 in/min
 JOB# 177:014010-012

Results

	Max Load (kgf)	Max Load (lbf)	Extension @ Max Load (mm)	Extension @ Max Load (in)	Pass/Fail	Max. Load (kgf)	Max. Load (lbf)
1	133.82	295.02	16.893	0.67	PASS	135.0	297.6

Curves

COMPLIANCE TEST DATA
FMVSS NO. 218 - MOTORCYCLE HELMETS

REPORT NO.: 218-UST-08-012

LAB REPORT NO.: 177:014010 - 012

DATE OF TEST: September 10, 2008

Paragraph S5.6

S5.6 *Labeling* – Each helmet shall be permanently and legibly labeled, in a manner such that the label(s) can be easily read without removing padding or any other permanent part, with the following:

Required Information	Pass	Fail
Manufacturer's name or identification	X	
Precise model designation	X	
Size	X	
Month and year of manufacture	X	
The symbol DOT... on the outer surface, in a color that contrasts with the background, in letters at least 1 cm high, centered laterally with the horizontal centerline of the symbol located a minimum of 2.9 cm and a maximum of 3.5 cm from the bottom edge of the posterior portion of the helmet	X	
Instructions to the purchaser as follows:	-----	-----
"Shell and liner constructed of (identify type(s) of materials)."	X	
"Helmet can be seriously damaged by some common substances without damage being visible to the user."	X	
"Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate.)"	X	
"Make no modifications."	X	
"Fasten helmet securely."	X	
"If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it."	X	

COMMENTS:

RECORDED BY: Edwin Rivera

APPROVED BY: Frank Savino

APPENDIX A

INTERPRETATIONS OR DEVIATIONS FROM FMVSS NO. 218

FROM FMVSS NO. 218

INTERPRETATIONS OR DEVIATIONS FROM FMVSS NO. 218

NONE

APPENDIX B

TEST EQUIPMENT LIST
AND
CALIBRATION INFORMATION

TEST EQUIPMENT

	<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>	<u>S/N</u>	<u>Cal. Period</u>	<u>Date of Last Cal.</u>	<u>Accuracy</u>	<u>Remarks</u>
1 .	Marker Stand	L.S. Starrett	----	----	N/A	N/A	N/A	Purchased 1995
2 .	Reference Headform	Bell	----	----	N/A	N/A	N/A	Purchased 1995
3 .	4.5kg (10 lb) Weight	----	----	----	Verified	9/08	± .05 kg ± 0.1 lb	Purchased 1995
4 .	Steel Ruler	L.S. Starrett		----	----	----	mm	Purchased 2005
5 .	Tespac	U.S. Testing Co.	800	N/A	N/A	N/A	N/A	Monorail Assembly Purchased 1980 Refurbished 2002
7 .	Impact Head Forms (Small, Medium & Large)	U.S. Testing Co.	A, C, D	----	----	----	----	Purchased 1998
8 .	Velocity Sensor	G.H.I.	VSD1	011101	1 Yr.	9/07	N/A	Purchased 2001
9.	MEP Pad	U.S. Testing Co.	1 in. Blue	----	N/A	N/A	N/A	Purchased 1999

TEST EQUIPMENT

	<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>	<u>S/N</u>	<u>Cal. Period</u>	<u>Date of Last Cal.</u>	<u>Accuracy</u>	<u>Remarks</u>
10.	Camera	Kodak	DX-4900	KCKAV2 3203	N/A	N/A	N/A	Purchased 2003
11.	Computer	G.H.I. CAT Sys	Helmet-4	C-4116-- --	1 Yr.	9/07	±2%	Purchased 2001
12.	Printer	HP Deskjet	840CD	----	N/A	N/A	N/A	Purchased 2001
13.	Hemi Anvil	U.S. Testing Co.	----	----	----	----	----	Purchased 1999
14.	Flat Anvil	U.S. Testing Co.	----	----	----	----	----	Purchased 1999
15.	Accelerometer	Kistler	8604B5000	C29636	1 Yr.	06/08	±1%	Purchased 1998
16.	Penetration Head Forms (Small, Medium & Large)	U.S. Testing Co.	----	----	----	----	N/A	Purchased 2006
17.	Penetration Striker	U.S. Testing Co.	218	----	Verified	8/08	N/A	6 lb, 10 oz. Wt. 60° included angle, cone ht. 1.5" 60RC Purchased 1995
18.	Universal Tester	Instron	5585	SI-16242	1 Yr.	6/08	±1/4%	Purchased 2003

TEST EQUIPMENT

	<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>	<u>S/N</u>	<u>Cal. Period</u>	<u>Date of Last Cal.</u>	<u>Accuracy</u>	<u>Remarks</u>
19.	Retention Head Forms (Small, Medium & Large)	----	----	----	----	----	----	Purchased 2006
20.	Retention Test Frame	Instron	----	SI-16353	N/A	----	----	Purchased 2004
21.	Linear Transducer	Omega	LD 300-25	M922068 A402-04	1 Yr.	6/08	±1/4%	Purchased 2004
22.	Protractor Stand	U.S. Testing Co.	----	----	----	----	----	Purchased 1990
23.	Oven	Despatch	LDB1-69	120943	N/A	6/08	----	Purchased 1990
24.	Freezer	VWR	A450720-A	TW- 50018H	N/A	6/08	----	Purchased 1995
25.	Temperature Recorder	Partlow	MRC7000	N/A	1 Yr.	6/08	±1%	Purchased 1995

APPENDIX C PHOTOGRAPHS

**DOT/NHTSA #177:014010-012 ARAI RX-7 CORSAIR
SZ: XL 61-62 cm**



**DOT/NHTSA #177:014010-012 ARAI RX-7 CORSAIR
SZ: XL 61-62 cm**



**DOT/NHTSA #177:014010-012 ARAI RX-7
CORSAIR SZ: XL 61-62 cm**



**DOT/NHTSA #177:014010-012 ARAI RX-7 CORSAIR
SZ: XL 61-62 cm**





Arai
HELMET

RX-1
CORSAIR

03 / 08

WARNING!

1. NO HELMET CAN PROTECT THE WEARER AGAINST ALL FORESEEABLE IMPACT. HOWEVER, FOR MAXIMUM PROTECTION, THE HELMET MUST BE OF GOOD FIT AND ALL RETENTION STRAPS MUST BE SECURELY FASTENED TO RETAIN THE HELMET. THE HELMET, WHEN FITTED, SHALL NOT BE REMOVED EASILY UNDER THIS CONDITION.

2. THIS HELMET IS SO CONSTRUCTED THAT THE ENERGY OF AN IMPACT MAY BE ABSORBED. THOUGH DAMAGE MAY NOT BE VISIBLE, IF IT SUFFERS SUCH AN IMPACT, IT MUST BE EITHER RETURNED TO THE MANUFACTURER FOR INSPECTION OR BE DESTROYED AND REPLACED.

3. THIS HELMET CAN BE SERIOUSLY DAMAGED BY SOME COMMON SUBSTANCES WITHOUT VISIBLE DAMAGE. APPLY ONLY LUKEWARM WATER AND NEUTRAL DETERGENT FOR CLEARING PURPOSE.

4. THIS HELMET IS CERTIFIED AS A FULL FACE HELMET.

MAKE NO MODIFICATION.

MADE IN JAPAN

ARAI HELMET, LIMITED

(1) SHELL AND LINER CONSTRUCTION OF FIBERGLASS REINFORCED POLYESTER RESIN AND EXPANDED POLYSTYRENE.

(2) HELMET CAN BE SERIOUSLY DAMAGED BY SOME COMMON SUBSTANCES WITHOUT DAMAGE BEING VISIBLE TO THE USER. APPLY ONLY THE FOLLOWING: LUKEWARM WATER AND DETERGENT FOR CLEANING. NO PAINTS OR ADHESIVES ARE ALLOWED TO BE USED ON THE LINER EXCEPT SUCH THAT MAY BE SUPPLIED BY ARAI HELMET, LTD.

(3) MAKE NO MODIFICATIONS. FASTEN HELMET SECURELY. IF HELMET EXPERIENCES A SEVERE BLOW, RETURN IT TO THE MANUFACTURER FOR INSPECTION OR DESTROY IT AND REPLACE IT.

(4) WARNING: NO HELMET CAN PROTECT THE WEARER AGAINST ALL POSSIBLE IMPACTS. THIS HELMET IS WARRANTED AS SERVICABLE ONLY FOR PROPERLY FITTED FIRST USER. IT SHOULD BE REPLACED AFTER NO MORE THAN 5 YEARS OF USE.

X L HEAD SIZE
7 1/2 - 7 5/8 (61 - 62 cm)
MADE IN JAPAN



**Fig. 1 – Impact Attenuation
(Paragraph S5.1)**



**Fig. 2 – Penetration
(Paragraph S5.2)**



**Fig. 3 – Retention System
(Paragraph S5.3)**



**Fig. 4 – Peripheral
(Paragraph S5.4)**